Earth's Structure and Processes

8-3 The student will demonstrate an understanding of materials that determine the structure of Earth and the processes that have altered this structure. (Earth Science)

8-3.8 Explain how earthquakes result from forces inside Earth.
Taxonomy level: 2.7-B Understand Conceptual Knowledge

Previous/future knowledge: Students were introduced to earthquakes in 3rd grade (3-3.8). Further study on the effects of earthquakes continued in 5th grade (5-3.1). The explanation of earthquakes as related to internal forces within Earth is new to this grade.

It is essential for students to know that the forces and stresses (8-3.7– tension, compression, and shearing) along faults can build up as blocks of rock are pushed (compression or shearing) or pulled apart (tension). If the pressure or stress becomes too great, the rock breaks at a weak point along the fault and energy is released.

- The energy spreads outward in all directions as vibrations called seismic waves.
- The focus of the earthquake is the point in the crust, or mantle, where energy is released.
- The epicenter is the point on Earth's surface directly above the focus; energy that reaches the surface is greatest at this point.

It is not essential for students to explain the magnitude or intensity of an earthquake; factors that affect the amount of damage done by an earthquake are also not necessary at this time.

Assessment Guidelines:
The objective of this indicator is to *explain* how earthquakes result from forces inside Earth; therefore, the primary focus of assessment should be to construct a cause-and-effect model that shows how internal forces along a fault can cause an earthquake. However, appropriate assessments should also require students to *compare* the focus or epicenter of an earthquake in terms of location and energy. -